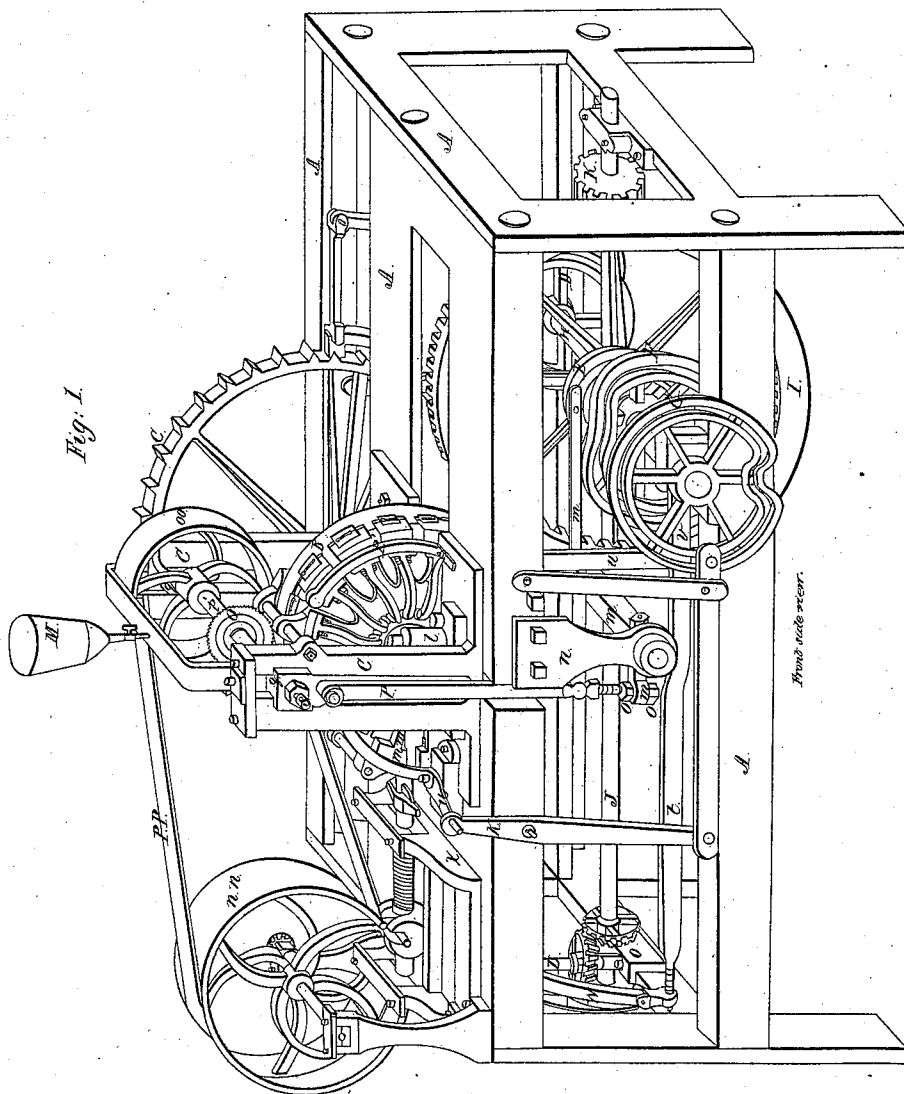


*I. W. Harvey,*  
*Making Wood Screws,*  
*Patented Mar. 25, 1837.*

*N<sup>o</sup> 148.*



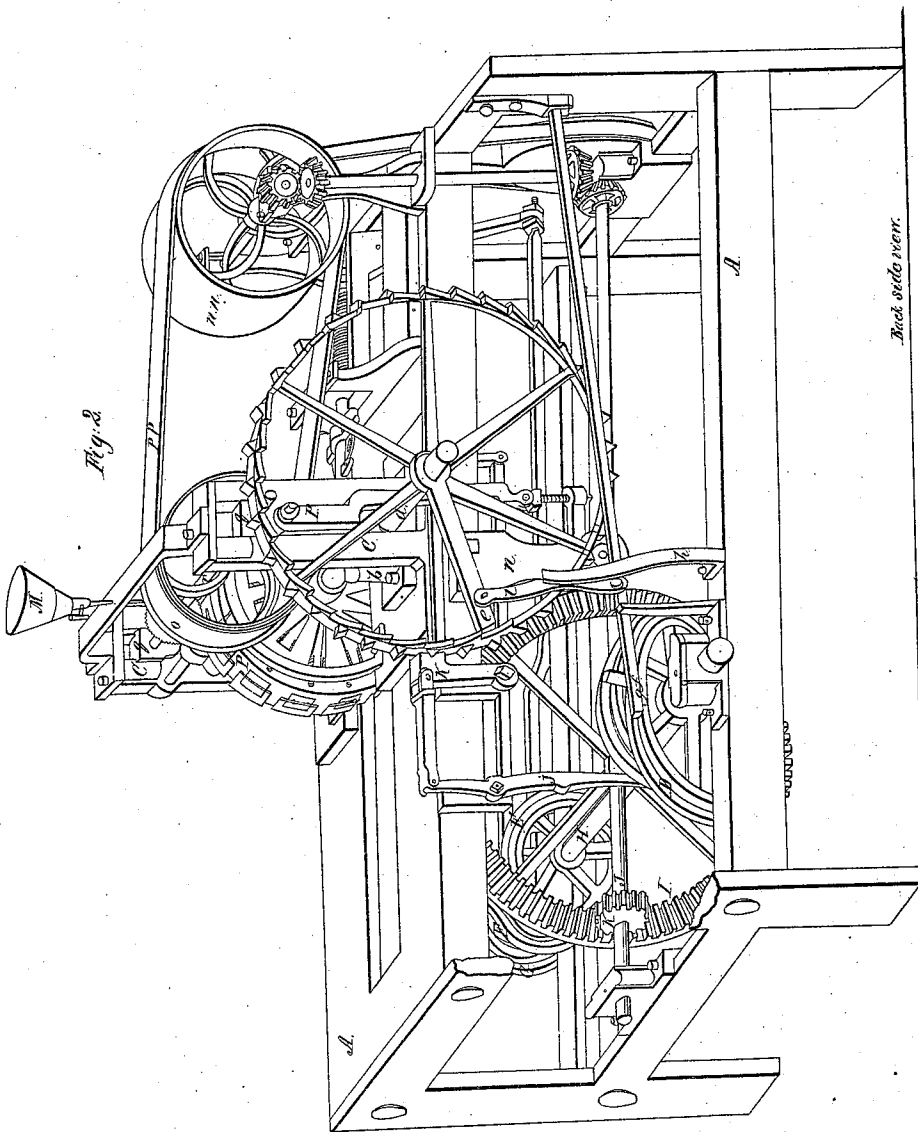
Sheet 2-A, Sheet 3.

*T. W. Harvey,*

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*Patented Mar. 25, 1837.*

*N<sup>o</sup> 148.*

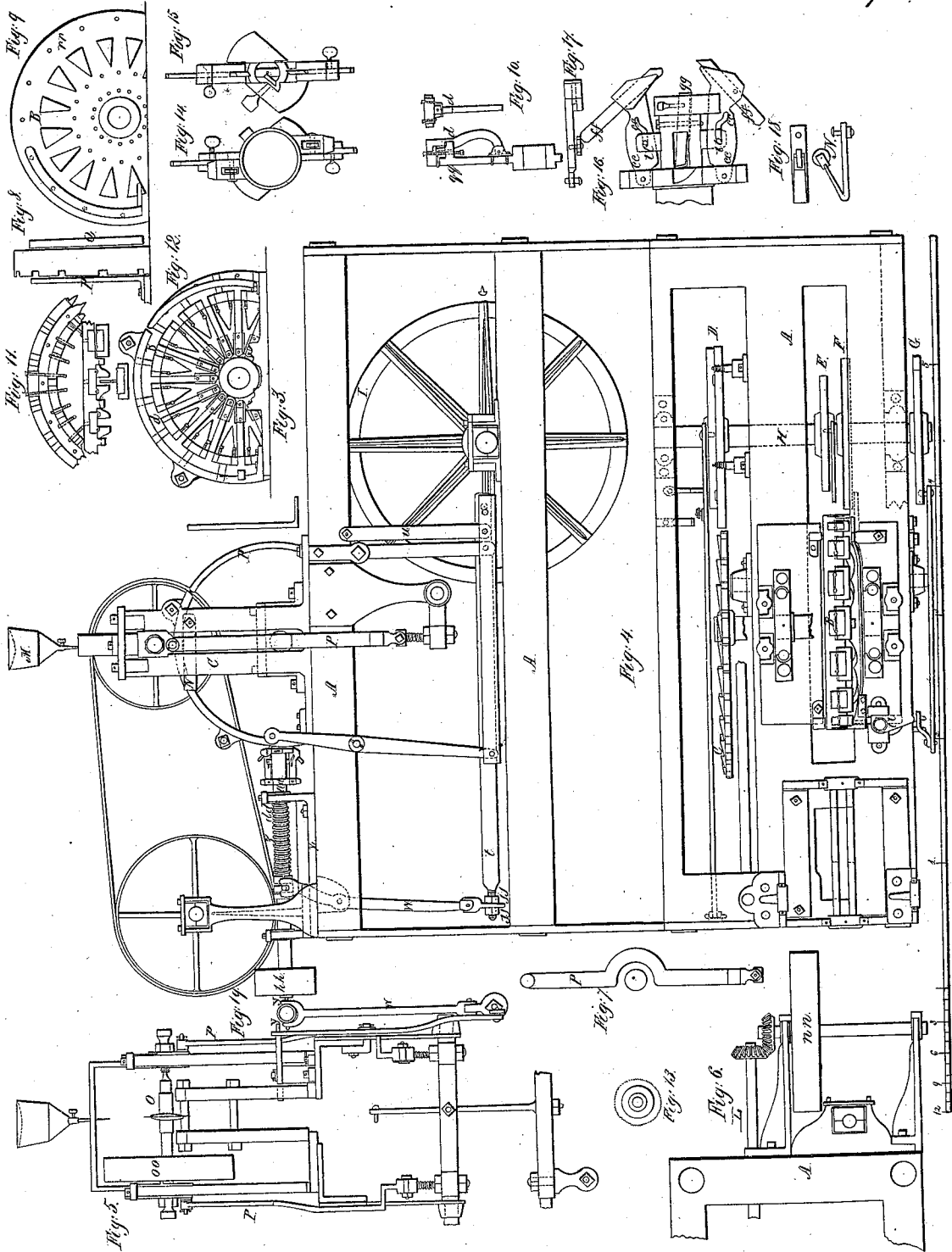


# T. W. Harvey,

## Making Wood Screws,

Patented Mar. 25, 1837.

No. 148.



Sheet 4-4 Sheets.

*Patented Mar. 25. 1837.*

N<sup>o</sup> 148.



# UNITED STATES PATENT OFFICE.

THOMAS W. HARVEY, OF POUGHKEEPSIE, NEW YORK.

## IMPROVEMENT IN MACHINES FOR NICKING AND TURNING THE HEADS OF WOOD-SCREWS.

Specification forming part of Letters Patent No. 148, dated March 25, 1837.

### *To all whom it may concern:*

Be it known that I, THOMAS W. HARVEY, of Poughkeepsie, in the county of Dutchess and State of New York, have invented a new and useful Improvement in Machines for Nicking and Turning the Heads of Screws, commonly called "wood-screws;" and I do hereby declare that the following is a full and exact description of the construction and operation of the said machine as invented by me, reference being had to drawings annexed.

Figure 1 shows a perspective view of the front side of the machine. Fig. 2 shows a perspective view of the back side of the machine. Fig. 3 shows a side view exhibiting the cutting-spindle. Fig. 4 shows a top view giving a view of the stands, &c. Fig. 5 shows an end view, giving a view of the saw and its connecting-bars. Fig. 6 shows an end view of the stands and driving-pulleys for saw and its connection with upright driving-shaft. Fig. 7 shows the connecting-bar of saw on the back side, bent to pass the main shaft of die-wheel. Fig. 8 shows the guide-pieces to die-wheel. Fig. 9 shows the blank piece of die-wheel before the fixtures are put to it. Fig. 10 shows a cross-section of die-wheel with a moving die-arm attached and the location of the screw in the die. Fig. 11 shows a side view of a part of the die-wheel, showing the temper-screw to regulate for the length of the screw, also the fastenings of dies and a top view of a part of die-wheel. Fig. 12 shows a side view of the die-wheel above the frame, showing the moving die-arms screwed on and regulating-screw partly exposed to view under said arms. Fig. 13 shows a side view of saw with the collars. Fig. 14 shows an end view of the cutting end of cutting-spindle without the cutters in. Fig. 15 shows the same parts with the cutters in. Fig. 16 shows a side view of the cutting end of cutting-spindle with the cutters in. Fig. 17 shows an edge view of one of the moving arms holding a cutter. Fig. 18 shows a side and edge view of the spring which holds up the moving die-arm while the nick is sawing. Fig. 19 shows an edge view of the arm or bar that moves the cutting-spindle. Fig. 20 shows the location of the driving-shaft and bevel-gears.

Fig. 21 shows a back side view showing the location of the ratchet-wheel and the ratchet and holdfast-catch. Fig. 22 shows one-half size section temper-screws and dies laid open right and left. Fig. 23 shows a side view of the eccentric grooved cam for raising and falling the saw in cutting the nick. Fig. 24 shows a side view of the eccentric grooved cam that moves the cutting-spindles. Fig. 25 shows a side view of the eccentric grooved cam for holding fast the screw in the die-wheel while turning the head. Fig. 26 shows a side view of two eccentric cams united, the face of one on one side and the face of the other on the other that gives motion to the ratchet and hold-fast. Fig. 27 shows an end view of the end piece of frame. Fig. 28 shows one-half size view of a cross-section of the die-wheel and a view of the dies. Fig. 29 shows an edge view of the catch and lever. Fig. 30 shows a side view of the bevel-pinion of driving-shafts.

In Fig. 1, A A A A, Fig. 2, A A, Fig. 3, A A, Fig. 4, A A, Fig. 6, A, Fig. 21, A A, Fig. 27, A, and Fig. 20, A A A are parts of the frame, which is made of cast-iron and is the superstructure of the machine to which the several parts are affixed.

In Figs. 1, 2, 4, 9, and 12, B is the die-wheel on shaft *a*, Figs. 1 and 2, which shaft rests on plumer-boxes *b*, Figs. 1 and 2, which plumer-boxes are attached to the stands *c c*, Figs. 1 and 2. Said die-wheel is shown at Fig. 9, the main piece, Fig. 10, a cross-section, showing the moving die-arm *d* attached.

In Figs. 1, 2, 4, and 21, C is the ratchet-wheel, having thirty-two divisions or ratchets corresponding with the number of dies for screws. Said wheel is fastened on shaft *a*, Figs. 1 and 2, and is moved by the hand *e*, Fig. 2, which hand swings on shaft *a*, Fig. 2, and is worked by the arm *f*, Fig. 2, which arm is carried by cam D, Fig. 2, being connected therewith by pin *g*, Fig. 2. Said hand is held up to ratchet-wheel by the spring *h*, Fig. 2, resting against shackle-bar *i*, Fig. 2. Said ratchet is held fast by the lever *j*, Fig. 2, working cam D, Fig. 2, by throwing back and forward the holdfast K, Fig. 2, upon the teeth on periphery of the ratchet-wheel.

In Figs. 1, 2, 26, and 4, D is the double eccentric cam working the ratchet-wheel C, its connections explained above.

In Figs. 1, 2, 4, and 23, E is an eccentric grooved cam for raising and falling the saw. It works lever *m m m*, Fig. 1, which lever is hung on stand *n*, Figs. 1 and 2, which lever is attached by regulating-screw *o o*, Fig. 1, to shackle-bar P, Figs. 1, 2, 3, and 7, and *p p*, Fig. 5, which shackle-bar is attached to slide-box *q q*, Figs. 1 and 2, upon which the saw-shaft *r*, Figs. 1 and 2, is hung on steel pivots *s*, Fig. 1. Said pivots are secured by screw-nut to the slide.

In Figs. 1, 2, 4, and 24, F is an eccentric grooved cam, which moves the cutting-spindle back and forward by working the arm *t*, Figs. 1 and 3. Said arm is suspended and directed on cam by the shackle-bar *u*, Figs. 1 and 3, and working in cam by the steel pin *v*, Fig. 1, and connected with the lever *w*, Figs. 1, 3, and 19, which lever *w* is attached to stand *x*, Figs. 3 and 1, and is attached to the cutting-spindle by a collar having wrists *y y*, Fig. 19, which collar turns on spindle and is kept in place by other collars, forming a flange on each side and fastened to spindle. The spring Z, Fig. 3, keeps the piece *a a*, Fig. 3, thrown forward, which is made to slide on the spindle when the spindle is drawn back. The pin *b b* and *b b*, Fig. 16, works in the eccentric grooves *e e e e*, Fig. 16, and throws open the tool-holders *c c* and *c c*, Fig. 16, acting against the spring, by which the tools clear the screw-heads, and as the spindle is thrown still farther back the piece *a a* is carried back against the box of stand *x* and admits of another screw coming onto the line of centers of the cutting-spindle in a manner not to stop the turn of the spindle. So, also, when the spindle is moved up to the work the spring carries the tools forward to the work open, the piece *a a* being brought up to the shoulder *d d*. The piece *a a* remains stationary, while the spindle by the action of the pin *b b* and *b b* closes the tools *f f* and *f f*, Fig. 16, under the heads at the same time the tool *g g*, Fig. 16, advances and turns the top of the head. The pulley *h h*, Fig. 3, on cutting-spindle is carried by pulley *i i*, Fig. 20. The regulating-screw at *j j* and *j j*, Fig. 3, carries up the tool *g g* less or more.

In Figs. 1, 2, and 4, G is an eccentric grooved cam, which holds fast the screws in the die-wheel while turning the head by working the lever *k k*, Fig. 1, which works the arm *l l*, Figs. 1 and 4. Said arm *l l* forms a toggle-joint on the piece *m m*, Figs. 1 and 4, and presses up the die and holds fast the screw.

In Figs. 1, 2, 20, and 4, H is a cross-shaft on which the large bevel-gear I is hung with the operating-cams.

In Figs. 1, 2, 3, 20, and 21, I is a large bevel-gear, seven and one-half to one of the pinion.

In Figs. 1, 2, and 20, J is a parallel and hori-

zontal shaft, to which the bevel-pinion K is attached, and carries upright shaft L, Figs. 1 and 2.

In Figs. 1, 2, 20, and 30, K is a small bevel-pinion on shaft J.

In Figs. 1, 2, and 6, L is an upright shaft carrying driving-pulley for saw *n n*, Figs. 1, 2, and 6, which pulley carries the saw-pulley *o o*, Figs. 1, 2, and 5, by the belt P P, Figs. 1 and 2, for which pulleys and belt I have used a chain belt and pulleys therefor to an advantage.

In Figs. 1, 2, and 3, M is a water-cup to drip while the saw is cutting.

In Figs. 3 and 18, N is a spring attached to stand *c*, Figs. 1 and 3, to hold up the die and grip the screw while the nick is sawing.

In Figs. 1 and 5, O is a saw secured on spindle by collars and screw.

In Figs. 1, 3, and 8, P' is a guide for die-wheel. This piece allows the die-arm *d* to open by the pin *q q*, Fig. 10, which is attached to die-arm, and passes through the holes *r r*, Fig. 9, and strikes against the guide Q, Fig. 8.

In Fig. 8, Q is a guide to open dies and allow the screws to drop out on the under side of die-wheel, and also to keep open forward of the saw to feed in the screw-blanks.

Operation: The screw-blanks are placed in the dies on the right side of die-wheel, Fig. 1. At each revolution of the shaft H the cam D disengages the holdfast K from the ratchet-wheel C, when the hand *e* moves up and turns the die-wheel one division, (thirty-two divisions or dies, less or more,) when the holdfast K again closes upon the tooth of ratchet-wheel and holds it firmly, while by the action of the cam E the saw is brought down upon the head of the screw at the vertical point of the die-wheel and commences cutting the nick and brings down the saw gradually. At the same time, by the action of the cam F, the cutting-spindle is brought forward at the horizontal point of the die-wheel and turns the head. At the same time, by the action of cam G on the piece *m m*, the screw is held firm when down, which is six-eighths of the time of the revolution of the shaft H. The spindle, retiring, moves back, and at the same time the saw rises up out of the nick just cut, and then the die-wheel is again turned round one division, as before described, and a fresh blank is brought under the saw and another fresh one is brought in the line of center of the cutting-spindle, and so on in succession as long as the dies are supplied with blanks the operation is kept up. Each screw as it passes the horizontal line drops out by the pin *q q* opening the moving die-arm. The pulley *i i* carries the pulley *h h* on the cutting-spindle, and the pulley *n n* the pulley *o o* on saw-spindle, both of which are kept constantly running. Remark, I usually arrange four of the above-described machines upon one frame.

What I claim as new, and wish to secure by Letters Patent in this machine, is—

1. The particular manner of constructing the die-wheel.

2. The particular manner of constructing the cutting-spindle.

3. The general combination of the different parts, by the union and arrangement of

which in one machine the nicking and turning of the heads are effected simultaneously, which operations have been heretofore performed separately and in distinct machines.

THOS. W. HARVEY.

Witnesses:

GEO. N. MINER,  
JAMES FOST.